CLAIMS

We claim:

1. A method for screening for a bioactive agent capable of binding to a cell cycle protein tankyrase H, said method comprising combining a cell cycle protein tankyrase H and a candidate bioactive agent, and determining the binding of said candidate agent to said cell cycle protein tankyrase H.

2. A method for screening for agents capable of interfering with the binding of a cell cycle protein tankyrase H and p21 comprising:

a) combining a cell cycle protein tankyrase H, a candidate bioactive agent and a p21 protein; and

b) determining the binding of said cell cycle protein and said p21 protein.

3. A method according to claim 2 wherein said cell cycle protein and said p21 protein are combined first.

4. A method for screening for an bioactive agent capable of modulating the activity of an cell cycle protein tankyrase H, said method comprising the steps of:

a) adding a candidate bioactive agent to a cell comprising a recombinant nucleic acid encoding a cell cycle protein tankyrase H;

b) determining the effect of the candidate bioactive agent on said cell.

5. A method according to claim 4 wherein a library of candidate bioactive agents are added to a plurality of cells comprising a recombinant nucleic acid encoding a cell cycle protein.

6. A method of diagnosing cancer, said method comprising determining the activity of tankyrase H from a test sample of an individual and comparing said level with a control which indicates there is no cancer, wherein an increase in the activity of tankyrase H in the test sample over the control sample indicates that the individual has cancer.

7. A method for screening for a bioactive agent capable of modulating the activity of a cell cycle protein tankyrase H, said method comprising the steps of:

a) adding a candidate bioactive agent to a reaction mixture, said mixture comprising

i) a source of poly ADP-ribose;

ii) a recombinant cell cycle protein tankyrase H;

iii) a substrate of cell cycle protein tankyrase H; and

b) determining the effect of the candidate bioactive agent on the PARP activity of said cell cycle protein tankyrase by determining the poly ADP-ribose content of the substrate.

8. The method of claim 25 wherein the source of poly ADP ribose is biotinylated NAD, and the

determination of poly ADP ribose content involves streptavidin-based-detection of biotin.

9. A method for treating an individual with a cell cycle related disorder, said method comprising administering to said individual an inhibitor of TaHo.

10. A recombinant nucleic acid encoding a cell cycle protein comprising a nucleic acid that hybridizes under high stringency conditions to a sequence complementary to that set forth by SEQ ID NO:1 or SEQ ID NO:2.

11. The recombinant nucleic acid of claim 10 wherein said protein binds to p21.

12. A recombinant nucleic acid encoding a cell cycle protein comprising a nucleic acid having at least 85% sequence identity to a sequence as set forth by SEQ ID NO:1 or SEQ ID NO:2.

13. A recombinant nucleic acid according to claim 10 having the sequence set forth by SEQ ID NO:1 or SEQ ID NO:2.

14. A recombinant nucleic acid encoding a polypeptide sequence as set forth by SEQ ID NO:3 or SEQ ID NO:4.

15. An expression vector comprising the recombinant nucleic acid according to any one of claims 10-14 operably linked to regulatory sequences recognized by a host cell transformed with the nucleic acid.

16. A host cell comprising the recombinant nucleic acid according to any of claims 10-14.

17. A host cell comprising the vector of claim 15.

18. A process for producing a cell cycle protein comprising culturing the host cell of claim 16 or 17 under conditions suitable for expression of a cell cycle protein.

19. A process according to claim 18 further comprising recovering said cell cycle protein.

20. A recombinant cell cycle protein encoded by the nucleic acid of any of claims 10-14.

21. A recombinant polypeptide comprising an amino acid sequence having at least 85% sequence identity with the sequence set forth by SEQ ID NO:3 or SEQ ID NO:4.

22. A recombinant polypeptide according to claim 21 wherein said polypeptide binds to p21.

23. A recombinant polypeptide according to claim 21 having an amino acid sequence as set forth by SEQ ID NO:3 or SEQ ID NO:4.

24. An isolated polypeptide which specifically binds to a cell cycle protein according to claim 21.

25. A polypeptide according to claim 24 that is an antibody.

26. A polypeptide according to claim 25 wherein said antibody is a monoclonal antibody.

27. A method for screening for a candidate bioactive agent capable of modulating PARP activity, comprising the steps of:

(i) providing a TaHo protein;

(ii) providing a candidate bioactive agent; and

(iii) providing a source of poly ADP-ribose;

and determining the amount of poly ADP-ribose associated with said TaHo protein, wherein said TaHo protein is encoded by a nucleic acid sequence having at least 90% identity to the nucleic acid sequence set forth in Figure 1 or 2.

28. A method according to Claim 27, wherein said candidate bioactive agent comprises a small molecule.

29. A method according to Claim 27, wherein said candidate bioactive agent comprises a peptide.

30. A method according to Claim 27, wherein said source of poly ADP-ribose is selected from the group consisting of NAD, biotinylated NAD, or radioactively labeled NAD.

31. A method for screening for a candidate agent capable of inhibiting proliferation, comprising the steps of:

(i) contacting a cell comprising a TaHo protein with a candidate bioactive agent; and

(ii) determining cell cycle progression in said cell.

32. A method according to Claim 31, wherein said cell is a tumor cell.

33. A method according to Claim 31, wherein said candidate bioactive agent comprises a small molecule.

34. A method according to Claim 31, wherein said candidate bioactive agent comprises a peptide.

35. A method for inhibiting growth of a tumor cell, comprising contacting said tumor cell with a bioactive agent capable of inhibiting TaHo activity.

36. A method according to Claim 35, wherein said bioactive agent comprises a small molecule.

37. A method according to Claim 36, wherein said bioactive agent comprises an antisense oligonucleotide.